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**The Analysis of Impact of Investment in Education on Economic  
Growth in Nigeria: Veracity of Association of Staff Union of  
University of Nigeria's (ASUU) Agitation**

**By**

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## ABSTRACT

*This study explored empirically the Impact of Investment in Education on Economic Growth in Nigeria between 1975 and 2012. The study is borne out of the curiosity to determine as claimed by the UNDP and other multilateral institutions the prominent roles play by the education in the growth and development of a developing nation like Nigeria. More so, the agitation of Association of Staff Union of Nigeria University of Nigeria (ASUU) that the federal government should invest more to develop infrastructures in our University. The research took the form of analytical/quantitative dimension; the quantitative technique is used in analysing data collected. Restricted Error Correction model is used with the aid of Econometrics View Package (E-view). In the study, Real Gross Domestic Product (RGDP) is used as proxy for economic growth, Government Capital Expenditure on Education (GKEE), Government Recurrent Expenditure on Education (GREE) are proxy to investment in human capital, Gross Capital Formation (GCF) as proxy for Capital and Post Primary School enrolment as a proxy for labour. The empirical analysis revealed that investment in human capital, in form of education and capacities building through training have positive impacts on economic growth in Nigeria. It is therefore, recommended that for effective and speedy economic growth and development in Nigeria, the government, should shoulder the major responsibility of financing primary, secondary and tertiary education, as these provide solid foundation for human capital formation which no country can do anything meaningful without. The other stakeholders like beneficiaries (students/parents), employer of labour, non-governmental organisation, community-based organisation should also collaborate with government to provide sufficient finance for the development of this sector as we all know that the sector has its product as merit-goods. The ASUU agitation and educational financing policy prescription on funding of the educational system most especially University (Agent of Change) should be jealously observed and implemented.*

## 1 INTRODUCTION

There can be no significant economic growth in any country without adequate investment in education. In the past decades, mostly during the Nigeria independence, the planning of Nigeria's economy was centred on accumulation of physical capital and Natural resources for rapid growth and development without recognition of important roles played by investment in education, as it enhances human capital development. This needs to be integrated into the planning process in order to achieve a sustainable economic growth and development.

Nigeria in 1959 recognized the importance of manpower needs of the nation when it set up a commission known as Ashby commission in April 1959 to conduct an investigation into Nigeria's need in the field of Education over the next 20 years. The then Nigeria economy was indisputably skill constrained. Equally undisputable is the significant positive role that education plays in increasing the productive capacity of the individual and the society, which contributes immensely to the economic growth. As a result, the recommendation of the commission report was investment in education. This aimed at upgrading Nigeria and development of nation's manpower through education (primary, secondary and tertiary) which will supply the country's manpower needs for the growth of the economy. Professor Harbison's special report on Nigeria manpower needs in this commission required substantial investment in education to ensure economic growth.

Investment in education is a process of human capital formation through acquisition of skills, abilities, experience resulting from expenditure in education. The process of increasing the number of people who have skills, education and experiences are critical for the economic goal of the country (Harbison, 1962). Education-investment in human capital is at least as important as investment in physical capital for a county's long run economic success (Gregory Mankiw, 1998). The United Nation Development Programme (UNDP, 2004) argue that growth and development should focus on human development through investment in education and health for the benefit of the people. On this basis, UNDP has evolved human development index (HDI) which includes the knowledge (Adult literacy, combined enrolment ratio) through education. This necessitates the country's commitment to education and acts as catalyst the government investing substantial part of their national income in education which is still below 26% budgetary allocation on education that was recommended by UNDP. So, education as a major contributory factor to economic growth through development of human productive capacity of the nation is not peculiar to Nigeria, it is a global phenomenon.

It is apparent that under-investment in education will constrain the skills, knowledge, competency of the people of the country and lead to economic retardation of such country. This is due to the fact that ignoring investment in education would mean ignoring major aspect of human capital development in the growth process, and leads to lowering the productive capacity of such economy. hence, reducing the rate of economic growth. In the light of these, there are different problem which will be serving as stumbling blocks in the process of investment in education in Nigeria, these includes: Problem of erratic and improper funding of education with its effect on inadequate and obsolete books, ill-equipped laboratory etc. Low school enrolment at all level of education in Nigeria which may be as a result of religious and cultural belief and gender sensitivity. Corruption on the part of top education officials siphoning the allocated fund

to education sector. Changing in the priority of the government and the political leaders compromising education with other sectors. Inconsistent revenue from the revenue base of the nation that brings about failure in the implementation of the educational plan.. This study will help to proffer some policy recommendation for both private individuals and government to improve investment in education in Nigeria. As this constitute the major means of achieving both medium and long term socio-economic goal set up by nations and the various international organisations. The conclusion that would be drawn and the recommendation that would be made will serve as a guide for policy makers in recognising the importance of appropriate investment in education as enunciated by UNDP that not less than 26% of annual budgetary provision should be committed to education sector. Ultimately, this research study will help us to determine the veracity of the Association of Staff Union Of University of Nigeria (ASUU)'s claim and agitation which resulted to six months industrial action, that Federal government of Nigeria should Increase Funding (Budgetary allocation to education) as the means to salvage our education system from further rotten; deliver our almost hijacked economy by foreigners and to promote Nigeria economy to the next level.

## **2 LITERATURE REVIEW**

### **2.1 Introduction**

The analysis of investment in education is unified in human capital approach. Human capital is the term economists often use for education, as and human capacities that can raise productivity when increased. An analogy is made to conventional investments in physical capital: After an initial investment is made, a stream of higher future income can be generated from expansion of education or increasing investment in education. As a result, a rate of return can be deduced and compared with returns to other investments. Investing in education also contribute directly to well being, but the human capital approach focuses on their indirect ability to increase ability by increasing incomes.

According to (Michael & Stephen), investment in education is equivalent to human capital development. He argues in his investing in education: The human capital approach, that the impact of human capital investments in developing countries can be quite substantial in the economic growth and development. It is now a generally accepted view that human resources or human capital plays significant role in the development of any nation. Investment in education is a major means of enhancing and developing the human capital. "...Human resources nor capital, nor income, nor material resources constitute the ultimate basis for the wealth of nations. Capital and natural resources are passive factors of production, human being are the active agents who accumulates capital, exploit natural resources, build social, economic and political organizations and carry forward national development. Clearly, a country which is unable to develop the skills and knowledge of its people and to utilize them effectively in the national economy will be unable to experience growth and development". This is a general pointer to the words of Harbison (1973).

Many economists still believe that physical capital constitute the major country's productive wealth, they still relegates the natural and especially human resources to the background. It took the effort of Theodore W. Schultz (1961) and others to rediscover the importance of human resources which has to more recent effort to incorporate investment in education into the mainstream of economic analysis.

## **2.2 Conceptual Issues**

### **2.2.1) Educational Investment: Consumption or Investment**

Those who view education as consumption argue that people receive education for its sake and they are never motivated by any economic considerations. The exponents of the investment view of education contend that education has economic value and therefore is an investment. Furthermore, whether people are motivated by the economic reward that accompany education or not doesn't preclude the fact that skills and knowledge are acquired and these increase human capabilities for any productive activity.

Two economic viewpoints-classical and Keynesian macro-economic are important in this discourse on whether educational expenditure should be treated as consumption or investment. The Keynesian economics recognizes consumption and investment expenditures as different component of national income. Keynesians economics treated formal education as consumption since household or government (acting on behalf of households by utilizing taxes collected) is responsible for educational funding. However, non-formal education like on-the-job training is seen as investment. Hence formal education cannot contribute to economic growth because it is a form of consumption from Keynesian macro-economic sense.

From the classical economic perspective, the nature of the goods in question forms the basis of classification into consumer or capital goods. Therefore investment is seen as those uses of current income which generate higher level of income in the future". From this economics view point, economic growth is increased by investment. Education can be said to be an investment in human capital with the hope to increase the productive capacity of human beings capital with the hope to increase the productive capacity of human beings and the possibility of receiving higher earnings in the future. Among those factors that improve human capabilities are health services and expenditure that influence life expectancy on-the-job training, formal education, study programmes for adults and migration of individuals to meet changing job opportunities (Schultz 1971). The educational activities in this list are useful in developing skills and knowledge in people to enhance their productivity.

The problem with the Keynesian definition of consumption and investments as applied to education is that it loses sight of the role that education can play in fostering economic growth since physical capital and human capital are complementary in the production process. The various skills and knowledge imparted in the process of education are, to a reasonable extent products of investment in human beings (Human Capital) because they have economic value education.

### **2.2.2 The Concept of Education**

In this broadest meaning, education is any process by which an individual gains knowledge or insight or develops attitude and skills. In its strict sense, it is a process to attain acculturation through which the individual attains the development of his potentialities, and their maximum activation when necessary, according to the right reason and to achieve his perfect self fulfilment. It is concerned with the activation of "the whole person including intellectual, affective, character and psychomotor development. It is the human resources of any nation, rather than its physical capital and material resources, which ultimately determine the character and pace of the economic growth. It is the formal educational system that is the major

institutional mechanism for developing human skills and knowledge required for economic growth of the nation.

### **2.2.3 The Concept of Human Capital**

Michael & Stephen (2006) documented that analysis of investment in education is unified in human capital approach. This assertion necessitates the review of the concept of human capital. In its very general form, human capital refers to the aggregate stock of a nation's population that can be drawn upon for present and future production and distribution of goods and services. UNECA (1990) defines human resources as the knowledge, skills, attitudes, physical and managerial efforts required to manipulate capital, technology and land among other things to produce goods and services for human consumption. In other words human resources are totality of human potentials (knowledge, skills, attitude, energy and technology) inherent within a nation's human resources stock and whose combine effort, if properly developed and harnessed, would yield a high level of labour productivity. Human resources development can therefore, be conceived as the process of developing the skills knowledge and the capabilities of all the people of the society. Education, formal and informal like on the job training, seminars, orientation programme for the employee are the means where by investment in human beings are under taken. The consequences of education in the term of skills embodied in people may, therefore, be useful as human capital. Consequently, the maintenance and improvement of skills and knowledge may be seen as investment in human being.

### **2.2.4 The Concept of Human Capital Formation**

The term human capital formulation or human resources developments is the process of acquiring and increasing the numbers of people who have skills, education and experience that are critical for the socio-economic development of a country (Harbison, 1952). Human capital formation/manpower development is therefore, associated with investment in human beings and their developments as creative and productive resources. It covers not only expenditure on education and training but also the development of attitudes towards productive activities.

UNDP (2001) defined human capital development as a process of expanding the developing capabilities of the people, in all economic social and cultural activities for a wealthier, more knowledgeable and meaningful life.

*Five ways of developing human resources, namely:*

1. Investment in health facilities and services, broadly conceived to include all expenditure that affect the life expectancy, strength and stamina, and vigour and vitality of the people;
- ii. On-the-job training, including old-type apprenticeships organized by firms;
- iii. Formally organized education at the elementary, secondary and higher (tertiary education) levels;
- iv. Study programmes for adults that are not organized by firms, including extension programmes notably in agriculture.
- v. Migration of individuals and families to adjust to changing opportunities. Meier (1970) asserts that human resources development concern the two fold objective of building skills and providing productive employment for non-utilised or underutilized manpower. Both are related to investment in man in the form of education and training, which are the means of human capital accumulation.

### **2.2.5 The Concept of Economic Growth**

Economic growth has been regarded as sine-qua-non for economic development. This early view of economic development dominated the thinking then, with a bias towards the objective of high economic growth. With such notion, national economic planners strove to expand production capacity to enhance economic growth. Unfortunately, that was not to be as the incidence of income inequality and poverty continued to increase despite the growth recorded in income countries. It must be admitted that economic growth is a necessary but insufficient condition for improving the lives of the poor. This becomes clearer when one compares the standard of living of people in Western Europe and North America where there is almost consistent high growth rates with that of their counterparts in Africa who record very low growth rates. With more emphasis of economic growth at the centre stage of the economic development, the people, mostly the poor in the society that would have been the main target of development are over-looked and often considered as mere factors of production. This implies that inequality in terms of income; choice and poverty among the greater part of the population were viewed as part of the necessary costs of economic growth and development.

This view began to wane with time. In the 1990s in particular, the human development approach to development became popular. This approach is defined as “the process of enlarging people’s choice. The most critical in these wide-ranging choices are to live a long and healthy life, to be educated and to have access to resources needed for a decent standard of living (UNDP 1990). The benefit of the human development perspective is that it considers income expansion on people’s choice and capabilities as the end of all development effort (Obikaomu 2002).

## **2.3 Theoretical Literature**

### **2.3.1 Education and Economic Development**

Contemporary discussions on education and economic development have been dominated by three main theories, namely;

- i. Theory of Human capital
- ii. Theory of Modernisation
- iii. Theory of Economic dependence

**i) The Human Capital Theory:** This theory emphasizes how education increases the productivity and efficiency of workers by increasing the level of their cognitive skills. Theodore Schultz, Cary Baker and Jacob Mincer introduced the notion that people invest in education to increase their stock of human capital. Examples of such investments include expenditure on education, on the job training, health and nutrition. Such expenditures increase future productive capacity at the expense of current consumption. However, the stock of human capital increases in a period only when gross investment exceeds depreciation with a passage of time, with intense use or lack of use. The provision of education is seen as a productive investment in human being, an investment which the proponents of human capital theory consider to be equally or even more equally worthwhile than that of physical capital.

In fact, contemporary knowledge in the United States acknowledges that investment in human capital is three times better than that in physical capital. Human capital theorists have established that basic literacy enhances the productivity of workers in low-skill occupations. They further state that an instruction that demands logical or analytical reasoning, or provides technical and specialized knowledge, increases the marginal productivity of workers in high-skill



or professional positions. It has been proven that the greater the provisions of schooling the greater the stocks of human capital in the society, consequently, the greater the increase in national productivity and economic growth.

**ii) The Modernization Theory:** this theory focuses on how education transforms an individual's value, belief and behaviour. Exposure to modernizing institutions, such as schools, factories and the mass media, implant modern values and attitudes. These attitudes include openness to new idea, independence from traditional authority, willingness to plan and calculate future needs and a growing sense of personal and social efficacy. According to modernization theorists, these normative and attitudinal changes continue throughout the life cycle, permanently altering an individual relationship to the social structure. The greater the number of the population changes in this way, the pace of the society's motions the necessary building blocks for a more productive work force and sustained economic growth.

**iii) The Dependence Theory:** this theory arose from Marxist conceptualizations based on the dynamics of the world system that structure conditions for economic transformation in both the core and periphery of the world economy. The proponents argue that the prevalence of foreign concentration on exporting of primary products and dependence on imported technologies and manufactured goods constrained long term economic development. However, certain features of the world policy, such as state fiscal strength, degree and regime of centralization and external political integration may contribute to economic growth in the developing world. Critics of these theories have, however, pointed to the evidence of widespread unemployment and its negative impact in economic growth. It was also pointed out that educated and healthy individuals with modern attitudes and values are causes of brain drain with its deleterious impacts on the stock of trained personnel, potentials entrepreneurs and, consequently, on the rate of growth and development. It is not surprising then that many people have become more cautious and sceptical about the presumed positive economic impact of education.

#### **2.4. Empirical Review on Human Capital Development**

The neo classical growth model has been the playing relevant roles in development economics for several decades. In spite of, its analysis remains imperfect because it assumes a perfect balanced relationship between the growth of labour force and the growth of population while treating technical progress as exogenous. This assumption can not hold under the weight of evidence for African countries, where rapid population growth rates and abundant labour supply have only induces poor growth performance. However, the literature of endogenous growth theory has stimulated economists in the empirical evidence available from cross-country comparisons, bearing on the main level relationships between human capital formation and the growth rate of the output. The growth model views human capital as an input to the production function and predict the growth rate is positively related to the stock of education.

Barro's (1991) study of 98 countries 1990, used school enrolment rates as process of human capital. His findings is that the growth rate of real per capital GDP is positively related to initial human capital proxy by 1960 school enrolment rates. In Romer (1990), human capital is the key input to the research sectors which generates the new product or ideas that underlies technical progress. As a result, countries with higher level of human capital achieve more rapid rate of introduction of new goods and services thereby, tend to experience grow faster. Romer (1986)

put forward an endogenous mechanism for the generation of economic development. An important insight provided by the author is the possibility for long run output per unit of input to increase, even when inputs were systematically accounted for. As a result of combination of highly skilled workers or particular forms of capital investment and the outcome of the use of technically advanced human capital and growth in knowledge base.

Romer and Weil (1992) used improved Solow growth model with the product of secondary school enrolment ratio and proportion of the labour force of secondary school age as a measure of investment in human capital. The results indicate that an investment in education significantly influenced per capital income growth. Appleton and Teal in 1998 conducted a study that shows that Africa is far low to what is obtainable in other part of the world. The study compares Africa's human capital formation with those of the other developing regions, particular South Asia. The index of human capital formation they computed, which is a composite of income, education and health, shows that Africa's level of human development is the lowest of all regions in the world. Neube in 1999 in Zimbabwe provides a quantitative evaluation of the effects of educational policy on economic growth. The result of the study shows that there is a long run relationship between capital investment in education and economic growth.

There are some studies that found negative and significant relationship between investment in education and human capital. The study like Banhabib and Spiegel (1994), use a standard growth accounting framework that includes initial per capital income and estimates of the year of schooling from Kyriakon (1990) and found a negative coefficient on growth of years of schooling. Baro empirical study in 1991 found a negative impact of human capital on growth when a student – teacher ratios and adult literacy were used at (1991) shown that the influence of human capital is not similar for all countries while a positive relationship is negative. In the study by Lau and other related studies shows that primary education has an estimated negative effect in Africa, middle East and North Africa, insignificant effects in East Asia and Latin America, and a positive significant effect in East Asia. In models with both levels of education they found a negative and significant relationship for primary and secondary education.

In Nigeria, there are few studies on the investment in education (specifically) on economic growth. Most related studies like Louis (2002), Okedara (1978) Patricia (2001), concentrates on finding the social and private returns to the different level of education at primary, secondary and tertiary, employing cross sectional data. On the basis of positive rate of returns often computed, conclusion is about the positive role of human resources (education) on economic growth.

In the work of Patricia in 2001 in her work on empirical investigation on the impact of human capital formation on economic growth in Nigeria spanning 1970 and 2000, employing co-integration and error correction technique the results indicate that investment in human capital in the form of education can lead to economic growth because of its impact on labour productivity. In 2002, Louis worked on the association between capital investment and economic growth in Nigeria and examined the nexus between employment and growth. The result confirms the positive impact of human capital on economic growth. The result provides weak evidence on the causality between the human capita and growth. The result suggests that the development of skills and knowledge, and effective utilization in the right direction is important for the achievement of country's growth and development objectives.

### 3 RESEARCH METHODOLOGY

#### 3.1 Introduction

This section discussed the theoretical framework of the study, model estimation procedure, technique and specification, sources, scope and characteristics of data employed in the study on the impact of investment in education on economic growth in Nigeria.

#### 3.2 Theoretical Framework

This study is anchored on the theoretical framework of Robert Solow (1956) who in his celebrated work of the core factors influencing economic growth isolated a key exogenous factor which significantly impact growth potential among economies. As noted by Abaido (2011), legion of empirical studies after Solow's work have significantly increase our understanding of the dynamic of economic growth and the key involving factors responsible for differential growth among developed and developing countries around the world. However, the Solow version of Neo classical is more suitable for this study due to its dynamism. The Solow model focuses on four variables: Output (Y), Capital (K), labour (L), and "knowledge" or the effectiveness of labour (A). At any point, the economy has some of amount of capital, labour and knowledge Romer (2009). These are combines to produce output. The production function takes the form:

$$Y(t) = f(K(t), A(t), L(t)) \quad (3.1)$$

Y(t) = output at time t, K(t) = capital at time t, L(t) = labour at time t, A(t) = knowledge at time t.

A(t) and L(t) enter the model multiplicatively, hence A(t) L(t) is effective labour

Note, there is technology progress if the amounts of knowledge (A) increase.

Hence, the specific example of production function is the Cobb Douglas function

$$Y = f(K_{(t)}, A_{(t)} L_{(t)}) = K_{(t)}^{\alpha} A_{(t)} L_{(t)}^{1-\alpha} \quad 0 < \alpha < 1$$

$$Y/AL = K/AL^{\alpha} (AL/AL)^{1-\alpha} \quad Y/AL = y \quad \text{and} \quad K/AL = k.$$

$$\text{Therefore, } y = k^{\alpha} \quad y_t = f(k_t) \quad (3.2)$$

This production function is very useful for the framework of the research at hand and shall be adapted to incorporate the variables of analysis in this study.

Movement of Labour / knowledge, Capital over time

$$\Delta K = K_{(t)} - K_{(t-1)} \quad \Delta K/K = \text{growth rate of Capital.}$$

$$\Delta L = L_{(t)} - L_{(t-1)} \quad \Delta L/L = \text{growth rate of Labour.} \quad \text{Labour is growing at the rate } n$$

$$\Delta A = A_{(t)} - L_{(t-1)} \quad \Delta A/A = \text{growth rate of knowledge.} \quad \text{Knowledge is growing at the rate } g$$

$$\text{Therefore, } k = K_{(t)} / A_{(t)}L_{(t)} \quad (3.3)$$

Using Quotient Rule to derive the fundamental Solow equation model from equation 3.2

$$\text{Hence, } k = \frac{\Delta K_{(t)}(A_{(t)}L_{(t)}) - (\Delta A_{(t)}L_{(t)}) K_{(t)} - (A_{(t)} \Delta L(t)) K_{(t)}}{(A_{(t)}L_{(t)})^2}$$

$$\Delta k(t) = \frac{\Delta K_{(t)}}{A_{(t)}L_{(t)}} - \frac{\Delta A_{(t)} K_{(t)}}{A_{(t)}(A_{(t)}L_{(t)})} - \frac{\Delta L(t) K_{(t)}}{L_{(t)}(A_{(t)}L_{(t)})}$$

Note:  $\Delta K_t = sY_{(t)} - dK_{(t)}$ ,  $\frac{\Delta A_{(t)}}{A_{(t)}} = g$ ,  $\frac{\Delta L_{(t)}}{L_{(t)}} = n$  and given that  $Y/AL = f(k)$

$$\Delta k(t) = \frac{sY_{(t)} - dK_{(t)}}{A_{(t)}L_{(t)}} - k_{(t)}g - k_{(t)}n = sf(k_{(t)}) - dk_{(t)} - g(k_{(t)}) - n(k_{(t)})$$

$$\Delta k(t) = sf(k_{(t)}) - (n+g+d)k_{(t)} \quad (\text{Key Equation of Solow model}) \quad (3.4)$$

$f(k(t))$  is output per unit of effective labour

$sf(k_{(t)})$  is actual investment per unit of effective labour

$(n+g+d)k_{(t)}$  is breakeven investment.

### An Extension Case: Economic Growth, Investment in Education

Thus the production function 3.1, becomes

$$Y(t) = K_{(t)}^\beta (A_{(t)}L_{(t)})^\theta \text{GKEE}_{(t)}^\gamma \text{GREE}_{(t)}^\lambda \quad (3.4)$$

Note:

$Y_{(t)}$  is economic growth proxy by **GDP Per Capita Constant 2000 US Dollar**

Effective Labour proxy by **School Enrolment Ratio (ENR)**

Capital at period  $t$  proxy by **Gross Capital Formation (GCF)**

Gross Fixed Capital Expenditure on Education **GKEE**

Gross Revenue Expenditure on Education **GREE**

Log both sides of the equation 3.3

$$\ln Y(t) = \beta \ln K_{(t)} + \theta \ln ENR_{(t)} + \lambda \ln GREE_{(t)} + \gamma \ln GKEE \quad (3.5)$$

Differentiating both sides with respect to time, we obtain the following:

$$gy = \beta gk + \theta gENR + \lambda gGREE + \gamma gGKEE \quad (3.6)$$

At the balance Growth Path (BGP) rate of growth of  $Y$  and growth of  $K$  is the same.

Hence,  $gy = \beta gk$

Therefore,  $gy = gk = \beta gk$ .

$$gy - \beta gy = \theta gENR + \lambda gGREE - \gamma gGKEE$$

$$\frac{gy(1-\beta)}{1-\beta} = \frac{\theta(gENR)}{1-\beta} + \frac{\lambda(gGREE)}{1-\beta} - \frac{\delta(gGKEE)}{1-\beta} \quad (3.7)$$

Therefore, the extended version of the Solow growth model indicates that growth rate of school enrolment, Gross Capital Expenditure on Education, Gross Revenue Expenditure on Education are determinants of output with positive relationship.

### The Functional Form of the Model

For the purpose of this research work the relationship among the dependent and independent variables is presented as follows:

$$PCGDP = f(GCF, ENR, GREE, GKEE) \quad (3.8)$$

### Model Specification

Having indicated from the extension version of Solow growth model that the energy resources and environmental factors are determinant of economic growth, hence in order to determine the

long run impact of the variables of interest of the study on the PCGDP and the short run dynamics of the model, the study employed the Vector Error Correction Model (Restricted VAR model). It should be noted that we can determine the long run and short run causality from the VECM. Therefore, for simplicity, on the basis of the above functional relationship the study specify

$$\Delta Y_t = \alpha_1 + \sum_{i=1}^{p=4} \delta_i^{GDP} \Delta GDP_{t-i} + \sum_{j=1}^{p=4} \beta_j^{GDP} \Delta GCF_{t-j} + \sum_{k=1}^{p=4} \theta_k^{GDP} \Delta ENR_{t-k} + \sum_{l=1}^{p=4} \lambda_l^{GDP} \Delta GREE_{t-l} + \sum_{m=1}^{p=4} \gamma_m^{GDP} \Delta GKEE_{t-m} + \phi_1 ECM_{1t-1} + e_{1t}$$

Where:

$Y_{(t)}$  is economic growth proxy by **GDP Per Capita Constant 2000 US Dollar**

Effective Labour proxy by **Post Primary School Enrolment Ratio (ENR)**

Capital at period  $t$  proxy by **Gross Capital Formation (GCF)**

Gross Fixed Capital Expenditure on Education **GKEE**

Gross Revenue Expenditure on Education **GREE**

$\alpha$  = Constant term,  $a$  = PCGDP coefficient,  $\beta$  = GCF coefficient,  $\gamma$  = LP coefficient,  $\theta$  = EU coefficient,  $\lambda$  = EC coefficient,  $\delta$  = CO<sub>2</sub> coefficient.

$\phi$  = Speed or rate of adjustment  $gy = \beta gk + \theta gENR + \lambda gGREE + \gamma gGKEE$

$p$  = lag length for the Vector Error Correction Model

$e$  = White Noise Disturbance Error Term.

## 4 DATA PRESENTATION AND ANALYSIS OF MODEL RESULT

### 4.1 Introduction

The important of human capital development through investment in education in achieving a sustainable economic growth cannot be over emphasized. The development of human capital has been recognized by development economists to be an important pre-requisite and an invaluable asset for a country socio-economic and political transformation (Michael & Stephen, 2006). Thus, in this research study we hypothesize that there can be no significant economic growth in any country without adequate investment in education. This hypothesis shall be confirmed through empirical investigation using secondary data between 1975 and 2012. Restricted VAR model (VECM) is employed for the analysis of this study. The basic macroeconomic variables of concern derived from the literature review and the theoretical framework are: real gross domestic product (RGDP) as proxy to Economic Growth, Government Capital Expenditure on Education (GKEE), Government Recurrent Expenditure on Education (GREE) are proxy to investment in human capital, Gross Capital Formation (GCF) as proxy to Physical Capital Formation.

### 4.2 Econometrics Analysis of the Study

Due to the properties of most time series, it is important to carry out the Unit root test on the series in the Vector Autoregressive (VAR) model. If the series are stationary, the results obtained from the VAR model are valid. However, if the series are non stationary, it is important to conduct Cointegration test to verify whether the time series are cointegrated or not. The Johansen Cointegration test has been found to be reliable and it is adopted in this study. If the Johansen Cointegration test indicates the existence of long run equilibrium in the model, then the VAR

model gives the long run causality in the equation of the model. Correspondingly, the short run dynamics of the model are captured with the Vector Error Correction Model which implies the short run adjustment.

#### 4.2.1 Test for Stationarity

This section presents the Unit root test conducted on the variables. As the first step, to diagnose the stationarity status of the variables in order to determine the appropriate test and estimation model to employ. Augmented Dickey- Fuller (ADF) test is used. According to Gujarati and porter (2009), it is conducted by augmenting the following:

Random walk:  $\Delta Y_t = \delta Y_{t-1} + u_t$

Random walk with drift:  $\Delta Y_t = \beta_1 + \delta Y_{t-1} + u_t$

Random walk with drift around a deterministic trend:  $\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum \alpha_i \Delta Y_{t-i} + \varepsilon_t$

**Table 4.2: Unit Root test applied to variables**

Variables	ADF TEST Critical Values	ADF Test Statistic	Prob- Values	Decision Rules
LNGDP	1% -3.626784	-3.426784	0.0000	I(1)
	5% -2.945842			
LNGCF	1% -3.626784	-7.500891	0.0000	I(1)
	5% -2.945842			
LNENR	1% -3.632900	-3.017220	0.0430	I(1)
	5% -2.948404			
LNGREE	1% -3.626784	-7.802564	0.0000	I(1)
	5% -2.945842			
LNGKEE	1% -3.626784	-8.309299	0.0000	I(1)
	5% -2.945842			

The unit root test is conducted on the variables, the variables found to be non stationary at level. A further test of stationarity by first difference shows the variables attained stationarity. LNGDP, LNGCF, LNENR, LNGKEE and LNGREE attained the stationarity at first difference. Consequentially, rejection of the null hypotheses of the presence of unit root in the variables at first difference for all the variables. The results of this test necessitate the performance of Cointegration test in order to confirm if there is existence of long run associationship or relationship among the variables.

#### 4.2.2 Cointegration Test

There are number of methods for testing cointegration, the Johansen test for cointegration has been found more reliable. Hence, the study used the Johansen test for cointegration.

**Table 4.3: Presentation of Johansen Test of Cointegration**

Hypotheses: Number of	Eigen Value	Trace Statistic	0.05 Critical Value	Probability Value

Cointegrating Equations				
0*	0.686083	85.99826	69.81889	0.0015
1	0.532847	44.28769	47.85613	0.1041
2	0.247807	16.88811	29.79707	0.6483
3	0.151473	6.636680	15.49471	0.6202
4	0.019898	0.723544	3.841466	0.3950

Source: computed by author; see appendix

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinn-Haug-Michelis (1999) p-values

The cointegration table above indicates 1 cointegration equations at the 0.05 level.

TABLE 4.3 presents the Johansen cointegration test, using the trace statistics with respect to the probability value. Considering the null hypothesis that there is none cointegrated equation which is rejected on the basis of p-value which is 0.0015. Hence rejection of the null hypothesis that there is none cointegrated equation. The other hypothesis that at most 1, 2, 3 and 4 equation is cointegrated cannot be rejected because their p-value is greater than 0.05 level which are 0.1041, 0.6483, 0.6202 and 0.3950 respectively. As a result of these, there is 1 cointegrated equation at the 0.05 level. The implication of this is that there is long run relationship or associationship among the variables; consequentially, this necessitates the use of restricted VAR i.e. Vector Error Correction Model.

#### 4.2.3 Vector Error Correction Analysis

Presentation of the Result: Vector Error Correction model:

$$D(LNRGDP) = C(1)*(LNRGDP(-1) - 0.121391237085*LNLCF(-1) + 0.171841210791*LNENR(-1) + 0.437601982582*LNLCKEE(-1) - 1.50358855829*LNLCREE(-1) - 5.78400977241) + C(2)*D(LNRGDP(-1)) + C(3)*D(LNRGDP(-2)) + C(4)*D(LNLCF(-1)) + C(5)*D(LNLCF(-2)) + C(6)*D(LNENR(-1)) + C(7)*D(LNENR(-2)) + C(8)*D(LNLCKEE(-1)) + C(9)*D(LNLCKEE(-2)) + C(10)*D(LNLCREE(-1)) + C(11)*D(LNLCREE(-2)) + C(12)$$

The VECM estimated values of the coefficients for Error Correction Equations is as follows:

$$D(LNRGDP) = 0.176937 + (0.270229)D(LNLCF(-2)) + (-0.735109)D(LNLCF(-2)) + (3.488586)D(LNENR(-2)) + (-0.831014)D(LNLCKEE(-2)) + (0.769237)D(LNLCREE(-2)) - 0.1432783 ecm1t-1 + e1t$$

#### 4.2.4 VECM Long Run Causality

Furthermore, LNLCF error correction equation was chosen to test and confirm the long run causality as reflected in table 4.5 below, the C(1) is 1-period lag residual of the cointegrating equation. This is the error correction term. The C(1) is negative as expected, and it is significant with the prob. Value of 0.0022 (2%) which is less than 0.05 level (5%). The rule is that if the error correction term is negative and significant i.e. the prob. Value 0.0049 is less than 0.05. Hence, there is long run causality from the explanatory variables (Gross Capital Expenditure on Education, Gross Recurrent Expenditure on Education) to economic growth (LNLCF).

**Table 4.5 Presentation of VECM Long Run Causality Model**

Dependent variable: LNGDP		Included observations: 28 after adjustments		
Error Correction Equation:				
$D(LNRGDP) = C(1)*(LNRGDP(-1) - 0.121391237085*LNGCF(-1) + 0.171841210791*LNENR(-1) + 0.437601982582*LNGKEE(-1) - 1.50358855829*LNGREE(-1) - 5.78400977241) + C(2)*D(LNRGDP(-1)) + C(3)*D(LNRGDP(-2)) + C(4)*D(LNGCF(-1)) + C(5)*D(LNGCF(-2)) + C(6)*D(LNENR(-1)) + C(7)*D(LNENR(-2)) + C(8)*D(LNGKEE(-1)) + C(9)*D(LNGKEE(-2)) + C(10)*D(LNGREE(-1)) + C(11)*D(LNGREE(-2)) + C(12)$				
	Coefficient	Std. Error	t.-statistic	Prob.
C(1)	-1.432783	0.460055	-3.114372	0.0049
C(2)	0.398161	0.376220	1.058321	0.3009
R-squared	0.567704			
Log likelihood	-60.35012			
F-statistic	2.745840			
Prob(F-statistic)	0.019785			
Durbin-Watson stat	1.993846			

Source: author; see appendix 4.4

**4.2.6 Short Run Causality Test**

To check the short run causality between the LNGDP and other variables like Gross Recurrent Expenditure on Education (GREE) and Gross Capital Expenditure on Education (GKEE) the study employed the Wald test by using chi-square value of Wald statistics to check the short run causality from Enrolment, Gross capital Expenditure on Education and Gross Capital Expenditure on Education (GKEE) to Economic growth (LNGDP).

Short run causality from GKEE and GREE to LNGDP

- 1) Null hypothesis: There is no short run causality from GKEE of Lag 4 to LNGDP

$$H_0: C(14)=C(15)=C(16)=C(17)=0$$

- 2) Null hypothesis: there is no short run causality from GREE of lag 4 to LNGDP

$$H_0: C(18)=C(19)=C(20)=C(21)=0$$

**Table 4.6: PRESENTATION OF WALD TEST RESULT**

H0: C(8)=C(9)=0 GKEE		
Test statistic	Value	Probability
Chi-square	1.870539	0.3925
H0: C(10)=C(11)=0 GREE		
Test statistic	Value	Probability
Chi-square	4.322683	0.1152

Source: author; see appendix 4.6



Analysis of Short Run causality from Gross Capital Expenditure on Education to Economic growth.

The chi square value is 1.870539 with probability value of 0.3925 (39%) which is greater than 0.05 (5%), therefore, acceptance of null hypothesis that there is no short run causality from Gross capital expenditure on education (GKEE) to GDP. This is as a result of the fact that dividend of such investment will take considerable longer period before it can be earned. Its contribution to growth and development can only manifested after some years.

Analysis of Short Run Causality from Gross Recurrent Expenditure on Education to Economic Growth.

The chi square value is 4.322683 with probability value of 0.1152 (12%) which is greater than 0.05, therefore, acceptance of null hypothesis that there is no short run causality from Gross current expenditure on education (GREE) to GDP. This is as a result of the fact that such expenditure is a recurrent one, that is channelled for the running of the educational system. If such expenditure is adequately made without misallocation it will improve the condition of services in the educational system and contribute to the growth objective in the long run.

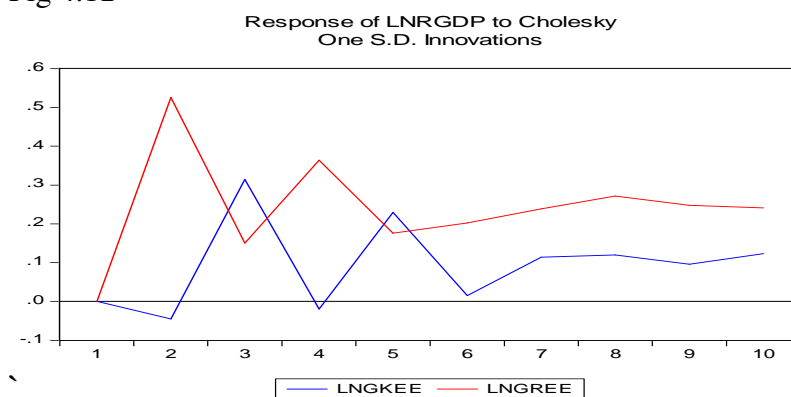
From the model it is indicated that C(8), C(11) are zero. This implies that all these variables have no short run causality to GDP.

Conclusively, there is long run causality from the variables, Gross Capital Expenditure on Education (GKEE), Gross Recurrent Expenditure on Education (GREE) and Enrolment of Post Primary School, to Economic growth (RGDP). While, there is no short run causality from these variables to Economic growth (RGDP) in Nigeria.

### Impulse Response Analysis

On the basis of vector auto-regression (VAR) model impulse response function is used to trace the response path of an endogenous variable Economic growth proxy by (RGDP) to a change in one of the innovations. This function determines the dynamic interplay between the variable and observe the adjustment speed in the system. Gross Capital Expenditure on Education and gross Capital Recurrent Expenditure on Education.

Fig 4.11



In the above IRF, the responds of endogenous variable, Economic Growth with respect to Gross Capital Expenditure on education GKEE is initially at the negative region to

year two before it started to respond positively to the shock from \GKEE, the reason for this is that such capital expenditure has longer gestation period. Such investment will first sink the cost before it started to contribute to economic growth through embarkation of its products (students) as a productive factor of production.

The response of economic growth to shock from the Gross Capital Recurrent Expenditure is positive directly. The reason for this is not unconnected to the fact that such expenditure entered to the circular flow of income in the economy directly by increasing consumptions and increasing the aggregate demand through Government expenditure component in income determination.

### Variance Decomposition

Analysis of Gross Capital Expenditure on Education.

The decomposition analysis in this study is limited to the main variable under study. The GKEE decomposition reflects that Economic growth and enrolment received more than other variables as GKEE variance decomposed. It is a fact that when more schools are built enrolment into school will grow. This conforms to the claim of UNDP that if government increase the capital expenditure on education, literacy level will also increase. Consequently, socio-economic growth objective will be accomplished. The effects of this break away variance is also observable in the economic growth proxy by RGDP, as RGDP receives as high as 12.4 while enrolment receive as high as 17.54 from the variance decomposed from GKEE.

Analysis of Gross Recurrent Expenditure on Education.

Consideration of the decomposed process of GREE it is seen that economic growth receives larger size of the decomposed variance to the tune of 49.27614 in the 10th period. Enrolment also receives larger part of the decomposed GREE. this is justification of the yelling by both international polity like UN, World Bank, UNESCO and the national bodies like ASUU, ASUPP etc.

#### VARIANCE DECOMPOSITION OF LNGKEE

PERIOD	SE	LNRGDP	LNGCF	LNENR	LNGKEE	LNGREE
1	0.458021	5.847313	1.919911	10.29885	81.93393	0.000000
2	0.689672	12.38774	6.210500	17.54773	63.09238	0.761651
3	0.841368	8.784895	4.437314	15.30363	70.36279	1.111374
4	1.018764	12.71149	3.106178	16.52395	65.61620	2.042176
5	1.114292	11.81913	3.149254	15.45534	67.20884	2.367430
6	1.245516	12.43992	2.582071	15.53422	66.98014	2.463647
7	1.337857	12.36077	2.475483	15.43503	67.12277	2.605947
8	1.428676	11.70997	2.347607	15.07861	68.25110	2.612719
9	1.521177	12.07232	2.228543	14.98716	67.97164	2.740339
10	1.597127	11.83444	2.130751	14.71577	68.53767	2.781366

#### VARIANCE DECOMPOSITION OF LNGREE

PERIOD	S.E.	LNRGDP	LNGCF	LNENR	LNGKEE	LNGREE
1	0.662436	17.82297	5.903939	15.43282	2.917698	57.92258
2	0.801921	22.37152	9.946429	16.30277	10.23884	41.14044
3	0.919194	32.81941	7.960549	15.65224	11.45052	32.11729
4	1.068648	44.71126	6.283581	13.89395	10.91074	24.20047
5	1.145203	44.73038	5.753461	15.05464	11.26265	23.19887

6	1.231963	45.83854	5.234019	14.65902	13.09021	21.17822
7	1.309104	46.88860	4.717949	15.01374	13.34813	20.03158
8	1.382248	47.43765	4.247484	15.58159	14.06735	18.66593
9	1.456664	48.83486	3.861229	15.66359	14.12913	17.51119
10	1.524111	49.27614	3.557591	16.05612	14.40413	16.70602

### 4.3 Diagnostics Test on Residual

#### 4.3.1 Test for Residual Auto-Correlation

This is the test for serial correlation in the model. The Breusch -Geofrey Serial correlation LM test is used to test the existence of serial correlation in the model.

Breusch-Godfrey Serial Correlation LM Test

Null Hypothesis (Ho): there is no serial correlation

Observation included: 33	Dependent Variable: Residuals		H <sub>0</sub> : no serial correlation
F-statistic	1.192665	Prob. F(4,7)	0.3923
Obs* R-squared	13.37493	Prob. Chi-Squared	0.0600

Source : author; see appendix 4.7

From the table, considering the prob. Chi-Square value of 0.0600 (6%) which is greater than 0.05 (5%) level. And, the decision rule is to accept the Null hypothesis (Ho) if the prob. Value is greater than 0.05; hence acceptance of the null hypothesis which stated above that there is no serial correlation in the model.

#### 4.3.2 Heteroscedasticity Test

According to Gujarati and Porter (2009), Autoregressive conditional heteroscedasticity (ARCH) may have an autoregressive structure, in that heteroscedasticity may be observed over different periods, hence it is needful to conduct the test for this study.

H<sub>0</sub>: there is no ARCH effect

H<sub>1</sub>: there is ARCH effect

Observation included: 33	Dependent Variable: RESID^2		H <sub>0</sub> : no ARCH effect
F-statistic	0.370754	Prob. F(4,24)	0.8271
Obs* R-squared	1.687691	Prob. Chi-Squared	0.7930

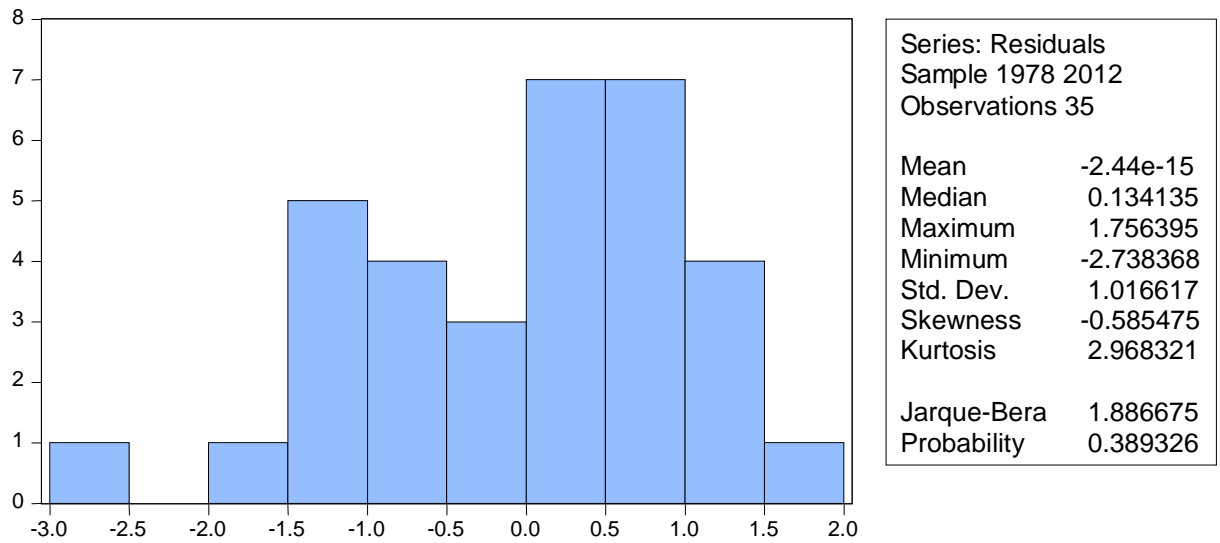
Source: author; see appendix 4.7

From the table above, the Prob. chi-Squared value of 0.7930 (70%) which is greater than 0.05 levels (5%), hence we accept the null hypothesis that there is no ARCH effect. This is desirable for the study because it signify that there is no heteroscedasticity problem in the causality model.

#### 4.3.4 Normality Test

##### Test for Normality of the Residual

H<sub>0</sub>: Null hypothesis: Residual is multivariate normal



Consideration of Jacque-Bera statistic with value 1.886675 and Prob. value of 0.389326 (39%) which is greater than 0.05 levels (5%). Hence, we accept the H<sub>0</sub> that the residual is normally distributed. Conclusion is that the residual of the model is normally distributed.

From the diagnostic tests we have conducted, the result shows that the causal model is free of serial correlation problems, the model has no ARCH effects and the residual is normally distributed. This gives us assurance that the results from the model are reliable, efficient and will be suitable for forecasting and policy and decision making.

#### 4.4 Investment In Education And Economic Growth In Nigeria: Findings And Policy Implications

The result of Dynamic VECM above indicates that there is long run relationship between GDP and GKEE together with GREE. This is confirmed by the negative value of the error correction coefficient with the probability value of 0.002 (2%) which is less than 0.05 (5%). The long run causality of the GKEE and GREE to Economic growth is indicated by the significance of the probability value. From the study it is shown that in the long run the post primary school enrolment and Gross Capital Expenditure and Gross Capital Recurrent Expenditure cause Economic Growth in Nigeria. Further test known as Wald test conducted to find out if there is existence of short run causality from GREE and GKEE to economic growth. The GKEE chi-square value of 1.965676 with probability value of 0.7421 and GREE chi-square value of 4.484560 with probability value of 0.3444 which are greater than 0.05, hence we accept the Null hypothesis that there is no short run relationship running from GKEE and GREE to Economic growth. These findings are not surprising due to a longer period that is required for the impact of capital investment in education to be felt on economic growth in terms of its contribution to national productivity through the participation of the Educational output (students) in the economy. The variance decomposition and Impulse Response Function also validate these. Other problems remain the poor manpower of the school turnout, which most times do not reflect the true manpower needs of the country.

Generally, low contribution of investment in education to the economic growth in Nigeria can be attributable to the structural defects, inefficiency and ineffectiveness which today places Nigeria at its lowest ebb in human resource development and utilization. The educational system tended to produce more of those who lack job skills for employment than those the economy requires to remain vibrant. The emphasis has been on linear expansion in the size of the educational system without any broad and dynamic conception of the qualitative dimensions of the system. Besides, the Nigerian educational institutions have been characterized by incessant strikes and disruption of academic activities, leading to shorter academic calendar. These, coupled with poor facilities such as ill-equipped laboratories, lack of teaching and research materials, inadequate classrooms, poor state of hostels, lack of electronic libraries, resulting from poor investment in education as lead to the production of graduates who lack the basic skills necessary for rapid economic growth of the Nigerian economy as agitated by Association of Staff Union of University of Nigeria which resulted to unfortunate (6 months industrial action) by the Union.

In the light of these, there are a lot of problems which serve as a stumbling blocks in the face of manpower development in Nigeria, these include:

- i. Problem of erratic and improper funding of education with its attendant effect of ill equipped laboratories, inadequate and out of date books in the libraries as well as the recruitment of incapable teachers.
- ii. Low school enrolment at all level of education in Nigeria and very low teacher-student ratio at both primary and secondary schools level.
- iii. Lack of proper human capital development programmes in Nigeria such as seminar, workshop, symposium and career talk which is capable of inculcating in people the idea of skills acquisition. This has render majority of Nigerians to be unskilled or semi skilled.
- iv. Problem of high unemployment rate among graduates of each of the various educational levels, which is due to the harsh economic environment. Also seems to discourage poor parents and their children from ensuring uninterrupted schooling.

## **5 SUMMARY, RECOMMENDATION AND CONCLUSION**

### **5.1 Summary of Findings**

This study explored empirically the relationship between investment in education and economic growth in Nigeria. The work was divided into five major chapters, the chapter one looked are the background, significant of study, necessary research questions and hypotheses were postulated. Nigeria; the impact of government expenditure of education on economic growth. The chapter two is literature review, the work reviewed relevant literatures related to the subject matter. From the literature review, the result confirmed the anticipated positive impact of investment in education as unified in human capital on growth.

The chapter three of the work is method of data analysis. The model was analyse with the aid of Econometrics Views (E-views), the model was estimated using annual data from 1975-2012. The chapter four is data presentation and analysis of the model result. From the findings, it was found

that investment in education, through the availability of infrastructural requirements in the education and recurrent expenditure on education sector accelerates economic growth. Generally, the findings show that, there is significant and long run relationship between human capital development through appropriate investment in education and economic growth in Nigerian context. This is evidence by the significance of probability value of error correction term. Thus, the results have far reaching policy implication as it suggests that the development of skills and knowledge, couple with their effective utilization is important for the country's growth and development.

## **5.2 Conclusion**

Appropriate investment in education is fundamental to any meaningful economic development programme that must be pursued by any developing nation especially like ours. It takes into account all the opportunities and strategies and challenges that might face the process of human development. Nigeria can only reposition herself as a potent force through the quantity and quality of the products from the primary, secondary and tertiary schools systems, and by making her manpower relevant in the highly competitive and globalize economy through a structured well-funded, appropriate, profitable investment in education in the right direction and strategies planning of her educational institution.

## **5.3 Policy Recommendation**

For effective and speedy economic growth and development in Nigeria, the government, beneficiaries (students/parents), employer of labour and other stakeholders in the society should share the responsibility for financing primary, secondary and tertiary education, as these levels provide solid foundation for human capital formation on any country since basic literacy and upward movements in education and training hierarchy depend on these levels.

The government should continue to encourage primary and post primary enrolments as this effort would add up to improve the low adult literacy level which remains as 57.0 percent. It should also provide the enabling environment by ensuring macro-economic stability that will encourage increase investment in education by the private sectors. In addition, the teachers/lecturers' salaries and improved working conditions in educational institutions should be accorded high priority by the government.

As regards physical capital formation in the education sector, government should increase spending on social and economic infrastructure in order to enhance the efficiency of the labour force and enhance productivity, and by implication, economic growth. Lastly, the efforts of government in increasing primary school enrolment through the free compulsory universal basic education is a right policy in the right direction towards the achievement of economic development so Universal Basic Education should be sustained and made free to the senior secondary school that is it should rounded educational policy to some extent beyond the currently running basic education. Finally, agitation of ASUU, and the lost of productive school calendar of six months due to the union's industrial action is a giant stride and right action at the right time bringing about paradigm shift in the perception of our political office holders on Nigeria education system.

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